

**REMARKS**

The Patent Office allowed claims 1-28. Claims 37-42 were previously withdrawn. The only remaining pending claims that are not allowed are claims 29-36.

Applicant has amended independent claim 29, from which claims 30-36 depend, and dependent claims 30 and 35. Claims 29-36 are patentable over the rejections set forth by the Patent Office ("PTO"), as discussed below.

**Rejection of Claims 29, 31, 32, and 34 Under 35 U.S.C. § 102(e) – Greeff**

The PTO rejected claims 29, 31, 32, and 34 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,075,973 to Greeff (hereinafter "Greeff"). Applicant has amended claim 29, from which claims 30-36 depend, to clarify the invention. Greeff does not anticipate or render obvious the invention in claims 29-36 as amended or even before such amendment.

First, the PTO points to antenna 46 in Figure 1 of Greeff as disclosing a dipole antenna operating at a first operating frequency, and antenna 44 in Figure 1 of Greeff as disclosing a loop antenna that operates at a second operating frequency. The PTO states that the loop antenna 44 is capacitively coupled to the dipole antenna 46.

The loop antenna 44 in Greeff is not coupled to the dipole antenna 46 in any manner, including capacitively, as is claimed in rejected claims 29-36. As shown in Figure 1, the antennas 44, 46 are decoupled from each other – one antenna is for reception and the other is for transmission, discussed in the next paragraph. For this reason alone, claims 29-36 are not anticipated by Greeff since Greeff does not disclose at least one limitation in claims 29-36.

Second, the PTO states that the transponder in Figure 1 of Greeff is configured so that the dipole antenna 46 receives a signal communicated from a remotely positioned interrogator at such first operating frequency, and the loop antenna 44 receives a signal communicated from a remotely positioned interrogator at a second operation frequency. This is incorrect. In Greeff, the dipole antenna 46 is for transmission only, and the loop antenna 44 is for reception only (see Greeff, col. 3, ll. 45-53; also see Figure 2 of Greeff in which the loop antenna 44 is connected to receiver 30, and the dipole antenna 36 is connected to transmitter 32). Therefore, Greeff does not disclose the limitation in claims 29-36 where the dipole antenna and loop antenna are coupled to each other where the dipole antenna acts as a reception antenna at a first operating frequency and the loop antenna acts as a reception antenna at a second operating frequency.

Further, applicant has amended claim 29, the independent claim from which claims 30-36 depend, to require that the dipole antenna be capacitively coupled to said loop antenna to form a first effective loop antenna operative at a second operating frequency, and a second effective loop antenna operative at a third operating frequency, such that the transponder can communicate at three operating frequencies – one for the dipole antenna, and two for the two loop antennas formed by coupling the dipole antenna to the loop antenna. This limitation is not disclosed in Greeff.

**Rejection of Claim 36 Under 35 U.S.C. § 103(a) – Greeff & Carr**

The PTO rejected claim 36 under 35 U.S.C. § 103(a) as being unpatentable over Greeff in view of U.S. Patent No. 4,433,336 to Carr (hereinafter “Carr”). In order to maintain a *prima facie* case of obviousness under § 103(a), the combined references must teach or suggest each element and/or limitation of the rejected claim. MPEP § 2143.03. Greeff in combination with Carr does not teach or suggest each element and/or limitation of rejected claim 36, and thus this objection must be withdrawn. Further, Carr teaches away from the present invention as evidence of non-obviousness.

Claim 36 depends from claim 29, which has been amended as discussed above. Also as discussed above, Greeff does not disclose several aspects of claim 29, and therefore claim 36, including (1) the dipole antenna being coupled to the loop antenna; (2) the loop antenna forming two effective loop antennas by the dipole antenna being coupled to the loop antenna; and (3) the dipole and loop antennas adapted to receive signals at different operating frequencies from a remotely positioned interrogator.

Carr does not teach or suggest an antenna arranged to operate at different frequencies with respect to one another to accomplish a multi-frequency operating system. A person of ordinary skill in the art would recognize that the objective of Carr is to provide a device “capable of distinguishing the direction from which signals are received.” (See Carr, col. 1, ll. 7-9). The Carr device uses the amplitude and phase relationship between the signals on coaxial cables 21 and 22 to determine the direction of arrival of a signal. (See Carr, col. 4, ll. 38-41). Each antenna in Carr needs to be operable to receive an incoming signal in order that a signal processor can determine the direction of arrival of the signal. Therefore, all three antennas of

Carr need to be able to receive an incoming signal at the same frequency and at the same time in order that the associated signal processor can determine the direction of arrival of the signal.

In fact, Carr teaches away from the present invention. Each antenna in Carr needs to be operable to receive an incoming signal in order that a signal processor can determine the direction of arrival of the signal. Therefore, all antennas of Carr need to be able to receive an incoming signal at the same frequency and at the same time in order that the associated signal processor can determine the direction of arrival of the signal.

Further, Carr does not disclose a dipole antenna coupled to a loop antenna, and whereby such coupling forms two effective loop antenna sections such that the dipole antenna and the two effective loop antenna operate at their own operating frequencies as is required by claim 36.

Therefore, Greeff in combination with Carr does not render claim 36 obvious.

**Rejection of Claim 30 Under 35 U.S.C. § 103(a) – Greeff & Gouin**

The PTO rejected claim 30 under 35 U.S.C. § 103(a) as being unpatentable over Greeff in view of U.S. Patent No. 6,211,846 to Gouin (hereinafter "Gouin"). In order to maintain a *prima facie* case of obviousness under § 103(a), the combined references must teach or suggest each element and/or limitation of the rejected claim. MPEP § 2143.03. Greeff in combination with Gouin does not teach or suggest each element and/or limitation of rejected claim 30, and thus this objection must be withdrawn. Further, Gouin teaches away from the present invention as evidence of non-obviousness.

Claim 30 depends from claim 29, which has been amended as discussed above. Applicant has amended claim 30 to include the limitation that the dipole antenna is asymmetrical, as was provided in original claim 29 before being amended in this response. As discussed above, Greeff does not disclose several aspects of claim 30 including (1) the dipole antenna being coupled to the loop antenna; (2) the loop antenna forming two effective loop antennas by the dipole antenna being coupled to the loop antenna; and (3) the dipole and loop antennas adapted to receive signals at different operating frequencies from a remotely positioned interrogator.

Also, Gouin does not disclose capacitive coupling between its loop and dipole antennas as required by claim 30. Gouin at column 3, lines 36-42, specifically states that the loop antennas (1-4) and the dipole antennas (6-9) are completely decoupled.

Further, Gouin does not teach or suggest an antenna arranged to operate at different frequencies with respect to one another to accomplish a multi-frequency operating system. A person of ordinary skill in the art would recognize that the objective of Gouin is to provide a device "capable of distinguishing the direction from which signals are received." (See Gouin, col. 2, ll. 29-48). Gouin discloses more than one dipole antenna; however, each antenna is an identical loop and operates at the same operating frequency. (See Gouin, col. 2, ll. 22-24). Gouin uses the amplitude and phase relationship between the signals on the individual dipole antennas to determine the direction of arrival of a signal. (See Gouin, col. 2, ll. 29-48). There is no reference or suggestion in Gouin that its antennas can be used to selectively communicate via one of the antenna based on the frequency of a received signal.

In fact, Gouin teaches away from the present invention. Each antenna in Gouin needs to be operable to receive an incoming signal in order that a signal processor can determine the direction of arrival of the signal. Therefore, all antennas of Gouin and Carr need to be able to receive an incoming signal at the same frequency and at the same time in order that the associated signal processor can determine the direction of arrival of the signal.

Further, Gouin does not disclose a dipole antenna coupled to a loop antenna, and whereby such coupling forms two effective loop antenna sections such that the dipole antenna and the two effective loop antenna operate at their own operating frequencies.

Therefore, Greeff in combination with Gouin does not render claim 30 obvious.

#### **Rejection of Claim 33 Under 35 U.S.C. § 103(a) – Greeff, Carr & Proctor**

The PTO rejected claim 33 under 35 U.S.C. § 103(a) as being unpatentable over Greeff in view of Carr and U.S. Patent No. 6,346,922 to Proctor et al. (hereinafter "Proctor"). In order to maintain a *prima facie* case of obviousness under § 103(a), the combined references must teach or suggest each element and/or limitation of the rejected claim. MPEP § 2143.03. Greeff in combination with Carr and Proctor does not teach or suggest each element and/or limitation of rejected claim 33, and thus this objection must be withdrawn. Further, Carr teaches away from the present invention as discussed above.

Claim 33 depends from claim 29, which has been amended as discussed above. Also as discussed above, neither Greeff nor Carr disclose several aspects of claim 33 including (1) the dipole antenna being coupled to the loop antenna; (2) the loop antenna forming two effective

loop antennas by the dipole antenna being coupled to the loop antenna; and (3) the dipole and loop antennas adapted to receive signals at different operating frequencies from a remotely positioned interrogator.

Carr also teaches away from the present invention. Each antenna in Carr needs to be operable to receive an incoming signal in order that a signal processor can determine the direction of arrival of the signal. Therefore, all antennas of Carr need to be able to receive an incoming signal at the same frequency and at the same time in order that the associated signal processor can determine the direction of arrival of the signal.

Proctor discloses an antenna arrangement containing two pole antennas. (See Proctor, Abstract). There is no disclosure of multiple transponders or wireless communication devices being coupled to the pole antenna, or a dipole antenna being capacitively coupled to a loop antenna. Further, there is no disclosure of a loop antenna forming two effective loop antennas by the dipole antenna being coupled to the loop antenna, or the dipole and loop antennas adapted to receive signals at different operating frequencies from a remotely positioned interrogator.

Therefore, Greeff in combination with Carr and Proctor does not render claim 33 obvious.

#### **Rejection of Claim 35 Under 35 U.S.C. § 103(a) – Greeff, Carr & Ehlers**

The PTO rejected claim 35 under 35 U.S.C. § 103(a) as being unpatentable over Greeff in view of Carr and U.S. Patent No. 4,727,598 to Ehlers et al. (hereinafter "Ehlers"). In order to maintain a *prima facie* case of obviousness under § 103(a), the combined references must teach or suggest each element and/or limitation of the rejected claim. MPEP § 2143.03. Greeff in combination with Carr and Ehlers does not teach or suggest each element and/or limitation of rejected claim 35, and thus this objection must be withdrawn.

Claim 35 depends from claim 29, which has been amended as discussed above. Claim 35 has been amended further to include a second loop antenna coupled to the dipole antenna that communicates at a further operating frequency. As discussed above, neither Greeff nor Carr disclose several aspects of claim 35 including (1) the dipole antenna being coupled to the loop antenna; (2) the loop antenna forming two effective loop antennas by the dipole antenna being coupled to the loop antenna; and (3) the dipole and loop antennas adapted to receive signals at different operating frequencies from a remotely positioned interrogator.

Carr also teaches away from the present invention. Each antenna in Carr needs to be operable to receive an incoming signal in order that a signal processor can determine the direction of arrival of the signal. Therefore, all antennas of Carr need to be able to receive an incoming signal at the same frequency and at the same time in order that the associated signal processor can determine the direction of arrival of the signal.

Claim 35 depends from claim 34, which depends from amended claim 29, and thus includes the same limitations with respect to Greeff and Carr as previously described above. Since claim 35, by its dependency from claim 29 via claim 34, includes at least one limitation that is not taught or suggested by the references in this rejection, this rejection cannot stand. MPEP § 2143.03.

It is not necessary for Applicant to address the Ehlers reference to overcome this rejection due to the deficiency in Greeff, but Applicant reserves the right to do so in the future if needed, without prejudice.

Therefore, Greeff in combination with Carr and Ehlers does not render claim 35 obvious.

The undersigned attorney would welcome a telephone interview if such would be helpful to the Examiner in this matter.

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